

In the Claims

The status of claims in the case is as follows:

1 1. [Previously presented] A method for filling a polygon
2 with a minimum number of rectangles, comprising:

3 bordering said polygon, including:

4 selecting a starting border width; and

5 merging border segments where possible; and then

6 orthogonally filling.

1 2. [Currently amended] A method for filling an original
2 polygon envelope with a minimum number of stripes,
3 comprising:

4 creating a border polygon including a plurality of
5 border segments;

6 merging border segments where possible; and thereafter
7 switching to generating orthogonal fill stripes; and

8 processing uncovered areas.

1 3. [Previously presented] The method of claim 2, further
2 comprising:

3 receiving input parameters, said input parameters
4 including parameters defining a minimum stripe width, a
5 maximum stripe width, and a merge adjacent borders
6 flag.

1 4. [Original] The method of claim 2, said input
2 parameters further including stripe overlap amount.

1 5. [Original] The method of claim 3, said input
2 parameters further including wire with ends size delta, and
3 maximum number of borders.

1 6. [Previously presented] The method of claim 3, said
2 creating a border polygon further comprising:

3 calculating a maximum current polygon border width
4 parameter for a current polygon;

5 responsive to said maximum current polygon border width
6 parameter, calculating a border width parameter for a
7 current border;

8 creating a border polygon with a width equal to said
9 border width parameter;

10 responsive to said merge adjacent borders flag being
11 enabled, creating a new border including merging said
12 current border with a previous border if possible;

13 responsive to said new border from said merging,
14 creating a new fill polygon;

15 creating a least encompassing rectangle for said new
16 fill polygon;

17 responsive to said least encompassing rectangle being

18 contained entirely within said original polygon
19 envelope, ending said creating a border polygon and
20 passing any uncovered area within said new fill polygon
21 to said generating; otherwise, returning to said
22 calculating width to process said new fill polygon as
23 said current polygon.

1 7. [Previously presented] The method of claim 6, said
2 calculating a maximum current polygon border width further
3 comprising:

4 adjusting said maximum stripe width input parameter to
5 a new upper limit which reflects characteristics of
6 said current polygon as well as any previous border
7 polygons.

1 8. [Previously presented] The method of claim 7, said
2 adjusting further comprising:

3 calculating the length of each side of said current
4 polygon;

5 deriving a smallest side length parameter equal to the
6 larger of (1) a first factor times said minimum stripe
7 width or (2) the length of the shortest side obtained
8 from said calculating length;

9 setting said smallest side length parameter from said
10 deriving to a reduced amount by a second factor;

11 if said current polygon is an inner border and said
12 smallest side length parameter is less than the
13 previous border width, setting said smallest side
14 length equal to said previous border width;

15 if said smallest side length parameter is greater than
16 said maximum stripe width parameter, setting said
17 smallest side length parameter equal to said maximum
18 strip width parameter; and

19 returning said smallest side length parameter for
20 processing as said maximum current polygon border width
21 parameter.

1 9. [Previously presented] The method of claim 8, said

2 calculating a border width for a current border further
3 comprising:

4 responsive to said minimum stripe width parameter and
5 said maximum current polygon border width parameter,
6 deriving a border width variable selectively operable
7 for determining that said current polygon is impossible
8 to be bordered or that said generating orthogonal fill
9 stripe be executed.

10. [Currently amended] The method of claim 9, said
1 deriving a border width variable further comprising:

3 initializing said border width variable equal to said
4 maximum current polygon border width parameter;

5 rounding said border width variable;

6 if said border width variable exceeds said maximum
7 stripe width parameter, setting said border width
8 variable equal to said maximum stripe width parameter;

9 iteratively shrinking and expanding said current

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10      polygon with a shrink value equal to said border width  
11      variable;
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12 if said shrinking causes said current polygon to shrink
13 to nothing, then indicating a solution is not possible;

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14     if said shrinking and expanding create a new polygon  
15     which completely covers said current polygon, then  
16     terminating said iteratively shrinking and expanding  
17     and returning said border width variable for use in  
18     subsequent processing; and
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19 if said shrinking and expanding create a polygon which
20 does not cover said current polygon, then returning
21 said minimum strip width parameter for use as said
22 border width variable in subsequent processing.

1 11. [Previously presented] The method of claim 6, said
2 generating orthogonal fill stripes, further comprising:

3 analyzing areas to be filled to determine optimal
4 stripe direction; and

5 iteratively generating fill stripes in said optimal
6 stripe direction to fill said areas to be filled.

1 12. [Previously presented] The method of claim 6, said
2 processing uncovered areas further comprising:

3 locating all uncovered polygon areas by subtracting the
4 union of all existing fill shapes from said original
5 polygon envelope; and

6 iteratively process each said uncovered polygon area,
7 selectively bordering and orthogonally filling those
8 uncovered polygon areas which are exterior polygons,
9 and filling with a single rectangle uncovered polygon
10 areas which are interior polygons.

1 13. [Original] The method of claim 8, said first factor
2 being 3 and said second factor being 0.8.

1 14. [Original] An artwork generating system, comprising:

2 an exposure tool for exposing a glass master to a
3 polygon envelop as a plurality of polygon fill stripes;

4 a polygon fill control module defining an optimum set
5 of said polygon fill stripes for filling said polygon
6 envelope, said control module being operable for

7 generating a first plurality of fill stripes
8 comprising a plurality of border polygons;

9 generating zero to a plurality of orthogonal fill
10 stripes; and

11 generating zero to a plurality of fill stripes for
12 processing uncovered areas.

1 15. [Previously presented] A method for filling an
2 original polygon envelope with a minimum number of stripes,
3 comprising:

4 generating a first plurality of stripes for creating a
5 border polygon;

6 generating a second plurality zero or more stripes
7 comprising orthogonal fill stripes; and

8 generating a third plurality of zero or more stripes
9 for processing uncovered areas.

1 16. [Original] A system for filling an original polygon
2 envelope with a minimum number of stripes, comprising:

3 means for generating a first plurality of stripes for
4 creating a border polygon;

5 means for generating a second plurality of zero or more
6 stripes comprising orthogonal fill stripes; and

7 means for generating a third plurality of zero or more
8 stripes for processing uncovered areas.

1 17. [Previously presented] A program storage device
2 readable by a machine, tangibly embodying a program of
3 instructions executable by a machine to perform a method for
4 filling an original polygon envelope with a minimum number

5 of stripes, said method comprising:

6 generating a first plurality of stripes for creating a
7 border polygon;

8 generating a second plurality of zero or more stripes
9 comprising orthogonal fill stripes; and

10 generating a third plurality of zero or more stripes
11 for processing uncovered areas.

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1 18. [Original] An article of manufacture comprising:

2 a computer useable medium having computer readable
3 program code means embodied therein for filling an
4 original polygon envelope with a minimum number of
5 stripes, the computer readable program means in said
6 article of manufacture comprising:

7 computer readable program code means for causing a
8 computer to effect generating a first plurality of
9 stripes for creating a border polygon;

10 computer readable program code means for causing a
11 computer to effect generating a second plurality of
12 zero or more stripes comprising orthogonal fill
13 stripes; and

14 computer readable program code means for causing a
15 computer to effect generating a third plurality of zero
16 or more stripes for processing uncovered areas.

1 19. [Previously presented] A computer program product or
2 computer program element

3 for filling an original polygon envelope with a minimum
4 number of stripes, according to a method comprising:

5 generating a first plurality of stripes for creating at
6 least one border polygon;

7 generating a second plurality of zero or more stripes
8 comprising orthogonal fill stripes; and

9 generating a third plurality of zero or more stripes
10 for processing uncovered areas.

1 20. [Previously presented] A program storage device
2 readable by a machine, tangibly embodying a program of
3 instructions executable by a machine to perform a method for
4 filling an original polygon envelope with a minimum number
5 of stripes, said method comprising:

6 receiving input parameters, said input parameters
7 including parameters defining a minimum stripe width, a
8 maximum stripe width, and a merge adjacent borders
9 flag;

10 first generating a first plurality of stripes for
11 creating at least one border polygon;

12 second generating a second plurality of zero or more
13 stripes comprising orthogonal fill stripes; and

14 third generating a third plurality of zero or more
15 stripes for processing uncovered areas;

16 said first generating including:

17 calculating a maximum current polygon border width
18 parameter for a current polygon;

19 responsive to said maximum current polygon border
20 width parameter, calculating a border width
21 parameter for a current border;

22 creating a border polygon with a width equal to
23 said border width parameter;

24 responsive to said merge adjacent borders flag
25 being enabled, creating a new border including
26 merging said current border with a previous border
27 if possible;

28 responsive to said new border from said merging,
29 creating a new fill polygon;

30 creating a least encompassing rectangle for said
31 new fill polygon; and

32 responsive to said least encompassing rectangle
33 being contained entirely within said original
34 polygon envelope, ending said creating a border
35 polygon and passing any uncovered area within said
36 new fill polygon to said generating a second
37 plurality of zero or more stripes comprising

38 orthogonal fill stripes; otherwise, returning to
39 said calculating width to process said new fill
40 polygon as said current polygon.

1 21. [Previously presented] A method for filling an
2 original polygon envelope with a minimum number of stripes
3 comprising:

4 receiving means for receiving input parameters, said
5 input parameters including parameters defining a
6 minimum stripe width, a maximum stripe width, and a
7 merge adjacent borders flag;

8 first generating means for generating a first plurality
9 of stripes for creating at least one border polygon;

10 second generating means for generating a second
11 plurality of zero or more stripes comprising orthogonal
12 fill stripes; and

13 third generating means for generating a third plurality
14 of zero or more stripes for processing uncovered areas;

1 22. [Previously presented] A method for filling an
2 original polygon envelope with a minimum number of stripes,
3 comprising of:

4 creating a border polygon;

5 generating orthogonal fill stripes;

6 processing uncovered areas;

7 receiving input parameters, said input parameters
8 including parameters defining a minimum stripe width, a
9 maximum stripe width, and a merge adjacent borders
10 flag;

11 said creating a border polygon further comprising:

12 calculating a maximum current polygon border width
13 parameter for a current polygon;

14 responsive to said maximum current polygon border
15 width parameter, calculating a border width
16 parameter for a current border;

17 creating a border polygon with a width equal to
18 said border width parameter;

19 responsive to said merge adjacent borders flag
20 being enabled, creating a new border including
21 merging said current border with a previous border
22 if possible;

23 responsive to said new border from said merging,
24 creating a new fill polygon;

25 creating a least encompassing rectangle for said
26 new fill polygon;

27 responsive to said least encompassing rectangle
28 being contained entirely within said original
29 polygon envelope, ending said creating a border
30 polygon and passing any uncovered area within said
31 new fill polygon to said generating; otherwise,
32 returning to said calculating width to process
33 said new fill polygon as said current polygon;

34 said calculating a maximum current polygon border width
35 including adjusting said maximum stripe width input

36 parameter to a new upper limit which reflects
37 characteristics of said current polygon as well as any
38 previous border polygons by

39 calculating the length of each side of said
40 current polygon;

41 deriving a smallest side length parameter equal to
42 the larger of (1) a first factor times said
43 minimum stripe width or (2) the length of the
44 shortest side obtained from said calculating
45 length;

46 setting said smallest side length parameter from
47 said deriving to a reduced amount by a second
48 factor;

49 if said current polygon is an inner border and
50 said smallest side length parameter is less than
51 the previous border width, setting said smallest
52 side length equal to said previous border width;

53 if said smallest side length parameter is greater
54 than said maximum stripe width parameter, setting

55 said smallest side length parameter equal to said
56 maximum strip width parameter; and

57 returning said smallest side length parameter for
58 processing as said maximum current polygon border
59 width parameter.

1 23. [Previously presented] The method of claim 22, said
2 calculating a border width for a current border further
3 comprising:

4 responsive to said minimum stripe width parameter and
5 said maximum current polygon border width parameter,
6 deriving a border width variable selectively operable
7 for determining that said current polygon is impossible
8 to be bordered or that said generating orthogonal fill
9 stripe be executed.

1 24. [Previously presented] The method of claim 23, said
2 deriving a border width variable further comprising:

3 initializing said border width variable equal to said

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4    maximum current polygon border width parameter;  
5    rounding said border width variable;  
6    if said border width variable exceeds said maximum  
7    stripe width parameter, setting said border width  
8    variable equal to said maximum stripe width parameter;  
9    iteratively shrinking and expanding said current  
10   polygon with a shrink value equal to said border width  
11   variable;  
12   if said shrinking causes said current polygon to shrink  
13   to nothing, then indicating a solution is not possible;  
14   if said shrinking and said expanding create a new  
15   polygon which completely covers said current polygon,  
16   then terminating said iteratively shrinking and  
17   expanding and returning said border width variable for  
18   use in subsequent processing; and  
19   if said shrinking and expanding create a polygon which  
20   does not cover said current polygon, then returning  
21   said minimum strip width parameter for use as said
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22 border width variable in subsequent processing.

1 25. [Previously presented] The method of claim 22, said
2 first factor being 3 and said second factor being 0.8.

1 26. [New] A method for filling an original polygon
2 envelope with a minimum number of stripes, comprising:

3 creating a border polygon;

4 generating orthogonal fill stripes;

5 processing uncovered areas;

6 receiving input parameters, said input parameters
7 including parameters defining a minimum stripe width, a
8 maximum stripe width, and a merge adjacent borders
9 flag; and

10 said creating a border polygon further comprising:

11 calculating a maximum current polygon border width
12 parameter for a current polygon;

13 responsive to said maximum current polygon border
14 width parameter, calculating a border width
15 parameter for a current border;

16 creating a border polygon with a width equal to
17 said border width parameter;

18 responsive to said merge adjacent borders flag
19 being enabled, creating a new border including
20 merging said current border with a previous border
21 if possible;

22 responsive to said new border from said merging,
23 creating a new fill polygon;

24 creating a least encompassing rectangle for said
25 new fill polygon; and

26 responsive to said least encompassing rectangle
27 being contained entirely within said original
28 polygon envelope, ending said creating a border
29 polygon and passing any uncovered area within said
30 new fill polygon to said generating; otherwise,
31 returning to said calculating width to process

32 said new fill polygon as said current polygon.

33 27. [New] The method of claim 26, said calculating a
34 maximum current polygon border width further comprising:

35 adjusting said maximum stripe width input parameter to
36 a new upper limit which reflects characteristics of
37 said current polygon as well as any previous border
38 polygons.

1 28. [New] The method of claim 26, said generating
2 orthogonal fill stripes, further comprising:

3 analyzing areas to be filled to determine optimal
4 stripe direction; and

5 iteratively generating fill stripes in said optimal
6 stripe direction to fill said areas to be filled.

1 29. [New] The method of claim 26, said processing
2 uncovered areas further comprising:

3 locating all uncovered polygon areas by subtracting the
4 union of all existing fill shapes from said original
5 polygon envelope; and

6 iteratively process each said uncovered polygon area,
7 selectively bordering and orthogonally filling those
8 uncovered polygon areas which are exterior polygons,
9 and filling with a single rectangle uncovered polygon
10 areas which are interior polygons.

1 30. [New] The method of claim 22, said first factor being
2 3 and said second factor being 0.8.